INTERNATIONAL STANDARD

ISO/IEEE 11073-10422

First edition
2017-10

Health informatics — Personal health device communication —

Part 10422: Device specialization — Urine analyser

Informatique de santé — Communication entre dispositifs de santé personnels —

Partie 10422: Specialisation des dispositifs — Analyseur d'urine

Reference number
ISO/IEEE 11073-10422:2017(E)

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Health informatics—Personal health device communication

Part 10422: Device Specialization—Urine Analyzer

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Approved 30 June 2016

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Abstract: Within the context of the ISO/IEEE 11073 family of standards for device communication, a normative definition of communication between personal telehealth urine analyzer devices and compute engines (e.g., cell phones, personal computers, personal health appliances, and set-top boxes) is established by this standard in a manner that enables plug-and-play interoperability. Appropriate portions of existing standards are leveraged, including ISO/IEEE 11073 terminology, information models, application profile standards, and transport standards. The use of specific term codes, formats, and behaviors in telehealth environments restricting optionality in base frameworks in favor of interoperability is specified. A common core of communication functionality for personal telehealth urine analyzers is defined in this standard.

Keywords: IEEE 11073-10422™, medical device communication, personal health devices, urine analyzer

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PDF: ISBN 978-1-5044-2270-3 STD21082
Print: ISBN 978-1-5044-2271-0 STDPD21082

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Introduction

This introduction is not part of IEEE Std 11073-10422™-2016, Health informatics—Personal health device communication—Part 10422: Device Specialization—Urine Analyzer.

ISO/IEEE 11073™ standards enable communication between medical devices and external computer systems. This document uses the optimized framework created in IEEE Std 11073-20601™-2014 and describes a specific, interoperable communication approach for urine analyzers.[1] These standards align with and draw on the existing clinically focused standards to provide support for communication of data from clinical or personal health devices.

[1]Information on references can be found in Clause 2.

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Health informatics—Personal health device communication

Part 10422: Device Specialization—Urine Analyzer

1. Overview

1.1 Scope

Within the context of the ISO/IEEE 11073™ family of standards for device communication, this standard establishes a normative definition of communication between personal telehealth urine analyzer devices and managers (e.g., cell phones, personal computers, personal health appliances, set-top boxes) in a manner that enables plug-and-play interoperability. It leverages appropriate portions of existing standards including ISO/IEEE 11073 terminology, information models, application profile standards, and transport standards. It specifies the use of specific term codes, formats, and behaviors in telehealth environments restricting optionality in base frameworks in favor of interoperability. This standard defines a common core of communication functionality for personal telehealth urine analyzers.

1.2 Purpose

This standard addresses a need for an openly defined, independent standard for controlling information exchange to and from personal health devices and compute engines (e.g., cell phones, personal computers, personal health appliances, and set-top boxes). Interoperability is the key to growing the potential market for these devices and to enabling people to be better informed participants in the management of their health.

1.3 Context

See IEEE Std 11073-20601™-2014 for an overview of the environment within which this standard is written.[2]

This standard defines the device specialization for the urine analyzer, being a specific agent type, and it provides a description of the device concepts, its capabilities, and its implementation according to this standard.

This standard is based on IEEE Std 11073-20601-2014, which in turn draws information from both ISO/IEEE 11073-10201™:2004 [B8] and ISO/IEEE 11073-20101™:2004 [B9].[3] The medical device encoding rules (MDER) used within this standard are fully described in IEEE Std 11073-20601-2014.

This standard reproduces relevant portions of the nomenclature found in both ISO/IEEE 11073-10101:2004 [B7] and IEEE Std 11073-10101a™-2015 [B5], and adds new nomenclature codes for the purposes of this

[2]Information on references can be found in Clause 2.
[3]The numbers in brackets correspond to those of the bibliography in Annex A.

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standard. Between this standard and IEEE Std 11073-20601-2014, all required nomenclature codes for implementation are documented.

NOTE—In this standard, ISO/IEEE 11073-104zz is used to refer to the collection of device specialization standards that utilize IEEE Std 11073-20601-2014, where zz can be any number from 01 to 99, inclusive.[4]

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ISO/IEEE Std 11073-20601™:2010/Amd 1:2015, Health informatics—Personal health device communication—Application profile—Optimized Exchange Protocol—Amendment 1.[5,6]

IEEE Std 11073-20601™-2014, Health informatics—Personal health device communication—Application profile—Optimized Exchange Protocol.[5, 6]

3. Definitions, acronyms, and abbreviations

3.1 Definitions

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.[7]

agent: A node that collects and transmits personal health data to an associated manager.

bilirubin: An orange-yellow pigment formed in the liver by the breakdown of hemoglobin and excreted in bile.

blood: Presence of red blood cells in urine that is not visibly apparent.

class: In object-oriented modeling, it describes the attributes, methods, and events that objects instantiated from the class utilize.

compute engine: *See:* **manager.**

device: A term used to refer to a physical apparatus implementing either an agent or a manager role.

glucose: A type of sugar that gives human body energy.

handle: An unsigned 16-bit number that is locally unique and identifies one of the object instances within an agent.

ketones: Water-soluble compounds that are produced as by-products when fatty acids are broken down for energy in the liver.

leukocyte esterase: Presence of enzyme in white blood cells.

[4]Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.
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[7]*IEEE Standards Dictionary Online* is available at: http://ieeexplore.ieee.org/xpls/dictionary.jsp.

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manager: A node receiving data from one or more agent systems. Some examples of managers include a cellular phone, health appliance, set-top box, or a computer system.

nitrite: Any salt or ester of nitrous acid.

object: In object-oriented modeling, a particular instantiation of a class. The instantiation realizes attributes, methods, and events from the class.

obj-handle: *See:* **handle.**

personal health device: A device used in personal health applications.

personal telehealth device: *See:* **personal health device.**

pH: A measure of the activity of the hydrogen ion. Essentially, it is a measure of acidity or alkalinity.

protein: A large group of nitrogenous compounds of high molecular weight that are essential constituents of all living organisms.

specific gravity: The ratio of the density of a substance to the density of a reference substance.

urine analyzer: An agent for measuring the amount of chemical substances in urine and some properties of urine.

urobilinogen: A colorless product of bilirubin reduction.

3.2 Acronyms and abbreviations

APDU	application protocol data unit
ASN.1	Abstract Syntax Notation One
DIM	domain information model
EUI-64	extended unique identifier (64 bits)
ICS	implementation conformance statement
MDC	medical device communication
MDER	medical device encoding rules
MDS	medical device system
MOC	managed object class
OID	object identifier
PDU	protocol data unit
PHD	personal health device
POC	personal device domain information model object and class
VMO	virtual medical object
VMS	virtual medical system

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